



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester: II
Class: PG-I	Program: F.Y M.Tech
Branch Code: CIV	Pattern: 2022
Name of Course: Advanced Design of Concrete Structures	Course Code:CIV225109
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 2 pages.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Question No. 1 Attempt following Question

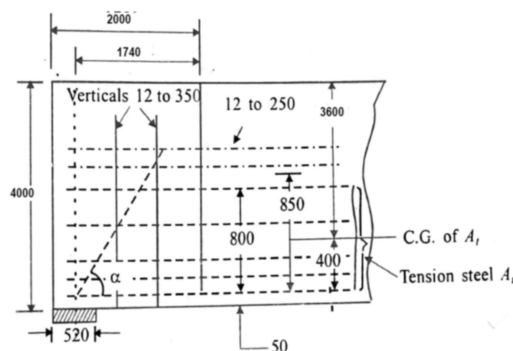
- 1a) What are the characteristic features of yield lines and draw the yield line pattern of rectangular slab (6) CO1,
for one edge is simply supported and remaining edges are rest on two column support. CO2

Question No. 2 Attempt following Question

- 2a) Explain the methods of determination of bending moment and shear force of flat slab. (6) CO1

Question No. 3 Attempt following Question

- 3a) Determine the thickness and reinforcements for a simply-supported transfer girder of length 5.25 m (8) CO1,
loaded from two columns at 1.75 m from each end with 3750 kN (see Fig.). The total depth of the CO2,
beam is 4.2 m and the width of supports is 520 mm. Assume grade 40 concrete and Fe 415 steel. CO3
(Design of simply-supported deep beam). (Shear check and R/F detailing not required).



OR

- 3b) A semi-circular beam with radius of 4 m is simply supported at ends, and is continuous over a column at its middle. The beam carries a uniformly distributed load of 20 kN/m length of the beam, inclusive of its own weight. Determine S.F., B.M. and T.M. at salient points. (8) CO1, CO2, CO3
- 3c) Write a note on Indian standard code for design for torsion for design of beams curved in plan (IS 456:2000). (8) CO1

OR

- 3d) Write short notes on beam curved in a plan designed and enlist the assumptions is made in the stress analysis. (8) CO1

Question No. 4 Attempt following Question

- 4a) Design a circular water tank with flexible base resting on the ground to store 50,000 litres of water. The depth of tank may be kept 4 m. Use M25 concrete and Fe-415 steel. (8) CO3, CO4

OR

- 4b) Design a rectangular water tank of 150m³ capacities that rest on ground and its vertical edge fix, bottom edge fix and top is free. Use M25 grade of concrete and Fe 415 Steel. (8) CO3, CO4

- 4c) Write down the design step of rectangular tank rest on ground by IS code method. (8) CO3

OR

- 4d) Write down the design step of circular water tank rest on ground by IS code method. (8) CO3

Question No. 5 Attempt following Question

- 5a) Design a pile under a column transmitting an axial load of 600 kN. The pile is to be driven to a hard stratum available at a depth of 8 m. Take $\sigma_{cc} = 4 \text{ N/mm}^2$ and $\sigma_{sc} = 130 \text{ N/mm}^2$. (8) CO3, CO4

OR

- 5b) Write down the design step for rectangular slab footing for two columns (combined footing). (8) CO3, CO4

- 5c) What is combined footing and at which situation combined footing provided. (8) CO3

OR

- 5d) Explain different types of combined footing along with their suitable application. (8) CO3

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